

ABSTRACT OF THE DISCLOSURE

An EGR-gas flow rate estimation apparatus for an engine including an exhaust circulation pipe connected between an exhaust passage and an intake passage of the engine, and an EGR control valve interposed in the exhaust circulation pipe and having a throttle portion. The apparatus estimates a provisional EGR gas flow rate G_{egr0} by use of a general formula $G_{egr0} = A_{egr} \cdot (2 \cdot P_{ex} \cdot \rho_a)^{1/2} \cdot \Phi$ ($\Phi = (((\kappa/(\kappa-1)) \cdot ((P_b/P_{ex})^{2/\kappa} - (P_b/P_{ex})^{(1+1/\kappa)}))^{1/2})$ where P_{ex} represents the exhaust pressure, P_b represents the intake pressure, A_{egr} represents the effective opening area of the throttle portion, ρ_a represents the density of EGR gas, and κ represents the specific heat ratio of EGR gas. Subsequently, the apparatus estimates the flow rate G_{egr} of EGR gas flowing into the intake passage, by multiplying the provisional EGR gas flow rate G_{egr0} by a correction value dP_{gain} corresponding to differential pressure ($P_{ex} - P_b$).